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TITLE: Image processor e.g. digital copier - has data rewriting unit which rewrites relation width index, mean value, information, symbol data according to the concentration level

PATENT-ASSIGNEE: MINOLTA CAMERA KK (MIOC)

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ABSTRACTED-PUB-NO: JP 10210293A
BASIC-ABSTRACT:

The processor has a compression encoder which converts the symbol data specified in the image data of each block to a gradation width index, mean value information and symbol data based on the difference of each pixel data. The converted data are stored in a memory.

A data rewriting unit rewrites the converted data of the predetermined binary image data that shows concentration level. The concentration level is specified based on mean value information in the relation width index belonging to the image detected by a detector.

ADVANTAGE - Prevents need of large capacity memory. Finishes process within short time.

ABSTRACTED-PUB-NO: JP 10210293A
EQUIVALENT-ABSTRACTS:

CHOSEN-DRAWING: Dwg.3/6

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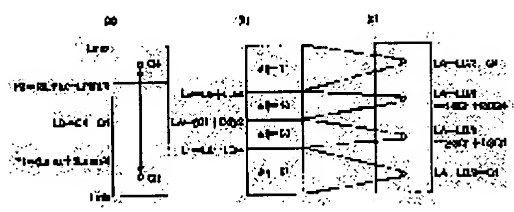
(71)Applicant : **MINOLTA CO LTD**

(72)Inventor : **SAKATANI KAZUTOMI**
IMAIZUMI SHOJI
NISHIGAKI JUNJI

(54) **IMAGE PROCESSOR**

(57)Abstract:

PROBLEM TO BE SOLVED: To eliminate the need for memory of large capacity for storing all image data by performing a binarization processing of a mat image area from encoded data by a compressing encoding means and to complete a processing in short time by reducing the number of data to which an arithmetic operation is performed.



SOLUTION: Image data of the read original is encoded by a block truncation encoding (GBTC) system and the binarization processing of the image data of the mat image area is executed, based on values of a gray level width index LD as characteristics volume obtained by the encoding and average value information LA. The image data of the original is divided by every block in a predetermined pixel matrix in the GBTC system. Then the average value information LA calculated by dividing the sum of the average value Q1 of data equal to or less than a parameter P1 and the average value Q4 of the data of the value equal to or more than a parameter P2 (P1<P2) determined from the data in the block by every block into equal halves and the gray level width index LD which is a difference between the average values Q4 and Q1 are used.

LEGAL STATUS

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to image processing systems, such as a digital process copying machine.
[0002]
[Description of the Prior Art] In the image processing system which adopts electrophotography methods, such as a digital process copying machine, the multiple-value image data which reads a halftone image and is obtained is changed into binary image data, and what forms an image on a form is known based on this binary image data. Moreover, when the printer of the destination is monochrome printer, the image processing system which changes and outputs multiple-value image data to binary image data is also known. The technique of sampling image data, performing a high-speed operation, and performing dither-pattern-izing and error diffusion process on real time, the technique of once memorizing all the multiple-value image data of the read manuscript in memory, extracting characteristic quantity from all the multiple-value image data written in memory, and performing binary-ization, etc. are known at the same time it reads the multiple-value image data of a manuscript as an image processing technique which makes multiple-value image data binary.
[0003]
[Problem(s) to be Solved by the Invention] The read multiple-value image data is sampled and a limitation is in the number of the image data which can be sampled on account of the data-processing rate in the image processing system of the type which performs a high-speed operation and performs binary-ized processing of dither-pattern-izing etc. on real time at the same time it reads the multiple-value image data of a manuscript. Moreover, the hardware circuitry of dedication is needed for improvement in the speed of processing separately, and a manufacturing cost is high. Moreover, mass memory is needed in the image processing system of the type which performs binary-ized processing once memorizing all the multiple-value image data of the read manuscript in memory. Moreover, there was a problem of requiring many operation times on the need of processing a lot of data at once.
[0004] The purpose of this invention is a easier configuration, and is offering the image processing system which performs binary-ization of multiple-value image data quickly.
[0005]
[Means for Solving the Problem] Image data is divided into the block which consists of predetermined pixel matrices in the image processing system of this invention. The gradation width-of-face characteristic specified in the image data of each block based on the difference of each pixel data which constitutes a block, A compression coding means to change into the average-value information specified based on the average value of each above-mentioned pixel data, and the code data specified based on each above-mentioned pixel data, The gradation width-of-face characteristic for every block called for by conversion by the compression coding means, average-value information, and a storage means to memorize code data, A detection means to detect the block belonging to a solid image based on the value of the gradation width-of-face characteristic memorized by the storage means, The gradation

width-of-face characteristic memorized by the storage means of the block belonging to the solid image detected by the detection means, It has the gradation width-of-face characteristic of the predetermined binary image data showing the concentration level specified in average-value information and code data based on the value of average-value information, average-value information, and the data rewriting means rewritten to code data. If the data rewritten by the data rewriting means are decrypted, the image data to which binary-ized processing was performed about the poor image can be obtained. Thus, in order to perform binary-ized processing of a poor image based on data after being changed by the compression coding means, the amount of the data used by processing compared with the case where binary-ized processing is performed using image data as it is decreases. Reduction of the memory space which binary-ized processing takes in connection with this, and compaction of the processing time are achieved.

[0006]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained with reference to an attached drawing. In the digital process copying machine which is the example of an operation gestalt of the image processing system of this invention, the image data of the read manuscript is encoded with a block truncation coding (henceforth GBTC) method, and binary-ized processing (dither-pattern-izing) of the image data of a solid image field is performed based on the gradation width-of-face characteristic LD which is the characteristic quantity obtained by the coding concerned, and the value of the average-value information LA. Hereafter, after giving explanation about the coding processing in a GBTC method, a digital process copying machine is explained. In the coding processing by the GBTC method, the image data of a manuscript is divided for every block of a predetermined pixel matrix. And the average Q1 and the parameter P2 of data not more than parameter P1 which are defined from the data within a block for every block (However, the relation of P1<P2 is filled.) The sum of the average Q4 of the data of the above value two The average information LA divided equally and searched for Based on the gradation width-of-face characteristic LD which is the difference of the above-mentioned average value Q4 and an average value Q1, compression coding of the data of each pixel within a block is carried out at code data phiij which quantizes on gradation level fewer than said data, and is obtained within the limits of the gradation distribution within the block concerned. Drawing 1 is drawing showing the flow of coding processing of the GBTC method performed in coding/decryption processing section 405 (see drawing 4) of the digital color copying machine of this operation gestalt. By the GBTC method, as shown in (a) of drawing 1 , the image data of a manuscript image is extracted per 4x4 pixel block. The image data within the extracted 4x4-pixel block the method which uses and explains drawing 2 below -- coding processing -- carrying out -- data [1 byte per each pixel (= 8 bits) of] x -- the image data for 16 pixels (16 bytes, i.e., 128 bits), as shown in (b) of drawing 1 the gradation width-of-face characteristic LD of 1 byte, and 2-bit code data phiijx which classifies 1 byte of average-value information LA, and the data of each pixel into four steps, and is similarly assigned -- it encodes to a total of 6 bytes (= 48 bits) of data for 16 pixels. This compresses the amount of data into three eighths. It is drawing where, as for (c) of drawing 1 , the amount of code data means that it is equivalent to a part for 6 pixels of image data before coding. A decryption of code data is performed by setting up 1 byte of image data corresponding to code data phiij 2 bits each based on the gradation width-of-face characteristic LD and the average-value information LA. In addition, in this copying machine, although the image data of a manuscript is extracted per 4x4 pixel block, it is not limited to this but you may extract a 3x3-pixel block and per 6x6 pixel block. Moreover, although 256 gradation data of each pixel within a block are encoded to code data phiij of 4 gradation, it is not limited to this but you may encode to code data, such as 8 gradation. It is because this copying machine detects a poor image based on the gradation width-of-face characteristic LD specified based on the difference of each pixel data which constitutes a block as a result of the coding processing by the GBTC method, and is characterized by to change this into the binary image by which a gradation expression is carried out by the area gradation method and neither the size of the above-mentioned block nor the number of gradation of code data is related to the binary-ized processing concerned.

[0007] Drawing 2 is drawing showing coding processing and decryption processing of a GBTC method.

From the image data extracted per 4x4 pixel block, predetermined characteristic quantity required for coding is calculated. Characteristic quantity is calculated by the following operations. In drawing 2 , (a) indicates relation with the gradation width-of-face characteristic LD to be Maximum Lmax, the minimum value Lmin, and parameters P1 and P2. First, Maximum Lmax and the minimum value Lmin of image data 8 bits each within a 4x4-pixel block are detected. Next, it asks for the parameter P1 which added one fourth of the differences of Maximum Lmax and the minimum value Lmin to the value of the minimum value Lmin, and the parameter P2 which added three fourths of the above-mentioned differences to the value of the minimum value Lmin. In addition, parameters P1 and P2 are called for by the operation of the following formula (1) and a formula (2).
[Equation 1]
P1= (Lmax+3Lmin)/4 .... (1)
[Equation 2]
P2= (3 Lmax+Lmin)/4 .... (2)
Next, the average Q1 of the image data of the pixel not more than parameter P1 is calculated among the image data of each pixel. Moreover, the average Q4 of the image data of the pixel beyond parameter P2 is calculated among the image data of each pixel. Based on the calculated averages Q1 and Q4, average information LA= (Q1+Q4) / 2, and gradation width-of-face characteristic LD=Q4-Q1 are calculated. Next, the operation of a formula (3) and a formula (4) is performed, and the reference values L1 and L2 used in case image data, 1 byte (8 bits), i.e., 256 gradation, of each pixel, is encoded to code data phiij of 2 bits, i.e., 4 gradation, are defined.
[Equation 3] L1=LA-LD/4 .... (3)
[Equation 4] L2=LA+LD/4 .... (4)
[0008] It sets in 4x 4-pixel block, and (b) of drawing 2 is eye the i-th train (however, it is i= 1, and 2, 3 and 4.). It is below the same and is the j-th line (however, it is j= 1, and 2, 3 and 4.). the following -- being the same -- it is drawing showing the value of code data phiij assigned according to the data value of the existing pixel Xij. According to the value of Pixel Xij, 2-bit code data phiij of the value shown in the next table 1 is assigned to a detail more.
[Table 1]

第ｉ行目、第ｊ行目にある画素Ｘｉｊの１バイト画像データの存在範囲	割り当てる２ビットの符号データφｉｊ
Ｘｉｊ≦Ｌ１	φｉｊ＝０１
Ｌ１＜Ｘｉｊ≦ＬＡ	φｉｊ＝００
ＬＡ＜Ｘｉｊ≦Ｌ２	φｉｊ＝１０
Ｌ２＜Ｘｉｊ	φｉｊ＝１１

In this way, the data encoded by the GBTC method are obtained. This data consists of code data phiij for 16 pixels (16x2 bits), a gradation width-of-face characteristic LD of 1 byte each (8 bits), and average information LA. In drawing 2 , (c) shows the data obtained by decryption processing. In case the data encoded by the GBTC method are decrypted, the gradation width-of-face characteristic LD and the average information LA are used. Specifically according to the gradation width-of-face characteristic LD and the value of the average-value information LA, and the value of code data phiij assigned to the pixel Xij in the j-th line of the i-th train, it transposes to 256 gradation data of the value which shows the data of Xij in Table 2.
[Table 2]

第ｉ行目、第ｊ列目の画素Ｘｉｊに割り当てられた２ビット符号データφｉｊの値	置き換える２５６階調データの値を求める式
φｉｊ＝０１	Ｘｉｊ＝ＬＡ－ＬＤ／２＝Ｑ１
φｉｊ＝００	Ｘｉｊ＝ＬＡ－ＬＤ／６ ＝２／３Ｑ１＋１／３Ｑ４
φｉｊ＝１０	Ｘｉｊ＝ＬＡ＋ＬＤ／６ ＝１／３Ｑ１＋２／３Ｑ４
φｉｊ＝１１	Ｘｉｊ＝ＬＡ＋ＬＤ／２＝Ｑ４

By the GBTC method, it is completely restored from the gradation width-of-face characteristic LD contained in the data with which parameters Q1 and Q4 were encoded, and the average LA. For this reason, a black part is less than [parameter P1], and this can be completely reproduced from the encoded data in binary images, such as a dither pattern [as / whose white part is more than parameter P2]. In addition, although coding processing and decryption processing can be performed also with the software according to the above-mentioned algorithm, they adopt hardware circuitry in this copying machine.
[0009] Drawing 3 is the configuration sectional view of the digital color copying machine of this operation gestalt. A digital full colour copying machine is roughly divided into the image read station 100 which reads the RGB image data of a manuscript, and the copy section 200. In the image read station 100, the manuscript laid on manuscript base glass 107 is irradiated with the exposure lamp 101. The reflected light of a manuscript is led to a lens 104 by three mirrors 103a, 103b, and 103c, and carries out image formation by the linear CCD sensor 105. The exposure lamp 101 and mirror 103a move in the direction of an arrow head (the direction of vertical scanning) at the rate V according to a setting scale factor by the scanner motor 102. Thereby, the manuscript laid on manuscript base glass is scanned over the whole surface. Moreover, with migration in the direction of an arrow head of the exposure lamp 101 and mirror 103a, Mirrors 103b and 103c are V/2 of rates, and, similarly move in the direction of an arrow head (the direction of vertical scanning). After the multiple-value electrical signal of three colors of R, G, and B which are obtained by the CCD sensor 105 is changed into 8-bit gradation data by the reading signal-processing section 106, it is outputted to the external I/O port 108 and the copy section 200 by it. The printer exposure section 202 generates a laser diode driving signal from the image data after amendment, and makes semiconductor laser emit light with this driving signal in the copy section 200. The laser beam generated from the printer exposure section 202 corresponding to gradation data exposes the photo conductor drum 204 by which a rotation drive is carried out through a reflecting mirror 203. Before the photo conductor drum 204 received exposure for every copy, it was irradiated with the eraser lamp 211, and it is uniformly charged with the electrification charger 205. If exposure is received in this condition, the electrostatic latent image of a manuscript will be formed on the photo conductor drum 204. Among cyanogen, a Magenta, yellow, and the toner development machines 206a-206d of black, first, toner development machine 206a of cyanogen is chosen, and the electrostatic latent image on the photo conductor drum 204 is developed. From a sheet paper cassette 212, the form of suitable size is conveyed and electrostatic adsorption is carried out by work of the adsorption charger 219 at the imprint drum 218. The toner image of cyanogen developed on the photo conductor drum 204 is imprinted by the tracing paper twisted on the imprint drum 218 by the imprint charger 209 after an excessive charge is removed by the eraser 208 before an imprint. Following cyanogen, a Magenta, yellow, and the toner development machine of black are chosen in order, and electrification of the photo conductor drum 204, exposure, and toner development are performed. The toner image of each color developed on the photo conductor drum 204 is imprinted in piles in order on the tracing paper twisted on the above-mentioned imprint drum 218. It is that the front face of the imprint drum 218 is discharged by

the separation electric discharge charger 221, it dissociates from the front face, and after being fixed to the tracing paper with which the toner image of 4 classification by color was imprinted through an anchorage device 223, it is discharged by the tray 224.

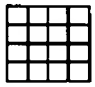
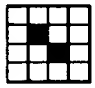
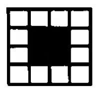
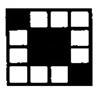
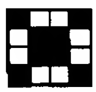
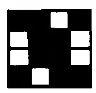
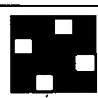
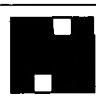
[0010] Drawing 4 is drawing showing each processing block of the reading signal-processing section 106. Each processing block is controlled by CPU407. ROM408 which stores a control program and various tables, and RAM409 used as working area are connected to CPU407. The CCD sensor 105 carries out A/D conversion of the image data of the read analog, digitizes it, and after it performs a predetermined shading compensation, it outputs it. The color correction processing section 401 amends each image data of R, G, and B to standard RGB image data OR, OG, and alumnus by which specification is carried out by the NTSC standard, Hi-Vision specification, etc., and outputs this. Each image data of OR, OG, and alumnus amended in the color correction processing section 401 is reflection factor data of a manuscript. Reflection / concentration transform-processing section 402 performs predetermined transform processing to each image data of OR, OG, and alumnus inputted, considers as the concentration data DR, DG, and DB, and outputs this. The masking processing section 403 changes the concentration data DR, DG, and DB into the cyanogen which is the toner color of a full colour copying machine, a Magenta, yellow, and the gradation data C, M, Y, and K of each color of black, and outputs this. In coding/decryption processing section 404, after the gradation data of C, M, Y, and K which are outputted from the masking processing section 403 are changed into code data by coding processing by the GBTC method, they are written in the compression image memory 406. Although explained in detail later, CPU407 detects the block which belongs to a solid image field based on the value of the gradation width-of-face characteristic LD for every block written in the compression image memory 406. And the gradation width-of-face characteristic LD, the average-value information LA, and code data phiij of the detected block are rewritten to the gradation width-of-face characteristic LD obtained by coding processing according the binary image data of the dither pattern specified based on the value of the average-value information LA to a GBTC method, the average-value information LA, and code data phiij. The above procedure performs binary-ized processing (dither-pattern-izing) of the solid part of the image formed on a form. After termination of the binary-ized processing in the above CPU 407, the gradation width-of-face characteristic LD written in the compression image memory 406, the average-value information LA, and code data phiij are read if needed, and after being decrypted, they are outputted to gamma amendment processing section 405. In gamma amendment processing section 405, gradation amendment processing is performed so that the concentration formed on tracing paper to the image data C1, M1, Y1, and K1 of the manuscript inputted may be reproduced by the linear. In the printer exposure section 202, based on the image data C2, M2, Y2, and K2 to which predetermined gradation amendment processing was performed in gamma amendment processing section 405, the driving signal of semiconductor laser is generated and this is outputted.

[0011] Drawing 5 is the flow chart of the image formation processing performed after a power source is switched on. First, initialization of the internal variable used for controlling the body of a copying machine and initialization of each element are performed (step S1). Copy mode according to the key input from the control panel (not shown) prepared in the top-face section of a copying machine is set up (step S2). According to the contents of the set-up copy mode, the shading compensation for image reading, preparation of each element for image formation, etc. are pretreated (step S3). Based on the set-up copy mode, image reading processing which controls a scanner and an image-processing circuit is performed (step S4). Coding processing by the GBTC method is performed to the image data of the read manuscript, and the data after coding are written in the compression image memory 406 (step S5). Coding processing here does not perform the coding itself by software processing, and compressive conditions are defined, or it means performing a certain processing to the data after compression, and a hard circuit realizes the coding processing by the GBTC method itself. Then, dither pattern-ized processing which detects the block belonging to a solid image and transposes the poor image of the detected block to the corresponding dither pattern of concentration level is performed from the value of the gradation width-of-face characteristic LD obtained by coding processing by the GBTC method (step S6). In addition, dither pattern-ized processing is explained later. After this dither pattern-ized

processing, from the compression image memory 606, code data is read, decryption processing is performed and it returns to image data (step S7). Based on the decrypted image data, a series of image formation processings (copy job) of the imprint of electrification of the photo conductor drum 204, exposure, toner development, and the toner image developed on the photo conductor drum 204 to tracing paper, fixing processing, etc. are performed (step S8). Of this image formation processing, the image with which binary-ized processing was performed about the poor image part is formed on tracing paper. Although it is not related to direct imaging processing of cleaning of the toner which remains on the photo conductor drum 204 after termination of image formation processing, and imaging processing etc., processing required in order to maintain the condition of equipment is performed (step S9). Finally, although it is not directly related to the above-mentioned control, after performing temperature control of an anchorage device 223, communications control in the external output port 108, etc., it returns to (step S10) and the above-mentioned step S1.

[0012] In dither pattern-ized processing (drawing 5 , step S6), CPU407 detects the block which belongs to a solid image first based on the gradation width-of-face characteristic LD obtained for every block by performing coding according image data to a GBTC method. And the binary image data of the dither pattern corresponding to the concentration level specified based on the value of the average-value information LA in the gradation width-of-face characteristic LD, the average-value information LA, and code data phiij of the detected block is rewritten to the gradation width-of-face characteristic LD encoded and obtained, the average-value information LA, and code data phiij, and binary-ization (dither-pattern-izing) of a poor image is performed. The next table 3 shows the gradation width-of-face characteristic LD, the average-value information LA, and code data phiij at the time of encoding the binary image data of the dither pattern PTn (however, 0<=n<=8) specified based on the value of the average-value information LA on a solid image, and each dither pattern with a GBTC method.

[Table 3]

LAの値	該当するディザパターンPTn		GBTC符号化後のデータ		
			LA	LD	φij
0≦LA<15	PT0		0	0	01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01
15≦LA<47	PT1		127	255	01 01 01 01 01 11 01 01 01 01 11 01 01 01 01 01
47≦LA<79	PT2		127	255	01 01 01 01 01 11 11 01 01 11 11 01 01 01 01 01
79≦LA<111	PT3		127	255	11 01 01 01 01 11 11 01 01 11 11 01 01 01 01 11
111≦LA<143	PT4		127	255	11 01 01 11 01 11 11 01 01 11 11 01 11 01 01 11
143≦LA<175	PT5		127	255	11 11 01 11 01 11 11 01 01 11 11 01 11 01 11 11
175≦LA<207	PT6		127	255	11 11 01 11 01 11 11 11 11 11 11 01 11 01 11 11
207≦LA<239	PT7		127	255	11 11 01 11 11 11 11 11 11 11 11 11 11 01 11 11
239≦LA≦255	PT8		255	0	11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11

Thus, since binary-ized processing is performed based on the data with which coding processing by the GBTC method was performed, the capacity of the memory (compression image memory 406) which the processing concerned takes can be managed with three eighths compared with the case where all image data is memorized. Moreover, since there are few amounts of the data used for binary-ized processing, software processing can also be ended without a special hard circuit in a short time. Drawing 6 is the flow chart of dither pattern-ized processing. When the value of the gradation width-of-face characteristic LD is five or less [which is a reference value] (it is YES at step S20), it is judged that the block concerned belongs to a solid image. The value used as the above-mentioned reference value is a value determined by the actual simulation. When the value of the average-value information LA is less than 15, the gradation width-of-face characteristic LD, the average-value information LA, and code data phiij of YES) and the block concerned are rewritten at the (step S21 to the gradation width-of-face characteristic LD, the average-value information LA, and code data phiij at the time of encoding the binary image data of a dither pattern PT 0 (step S22). Hereafter, similarly, when the values of the average information LA are 15 or more and less than 47, the gradation width-of-face characteristic LD, the average information LA, and code data phiij of YES) and the block concerned are rewritten at the (step S23 to the gradation width-of-face characteristic LD, the average information LA, and code data phiij at the time of encoding the binary image data of a dither pattern PT 1 (step S24). When the values of the average information LA are 47 or more and less than 79, the gradation width-of-face characteristic LD, the average information LA, and code data phiij of YES) and the block concerned are rewritten at the (step S25 to the gradation width-of-face characteristic LD, the average information LA, and code data phiij at the time of encoding the binary image data of a dither pattern PT 2 (step S26). When the values of the average information LA are 79 or more and less than 111, the gradation width-

of-face characteristic LD, the average information LA, and code data phiij of YES) and the block concerned are rewritten at the (step S27 to the gradation width-of-face characteristic LD, the average information LA, and code data phiij at the time of encoding the binary image data of a dither pattern PT 3 (step S28). When the values of the average information LA are 111 or more and less than 143, the gradation width-of-face characteristic LD, the average information LA, and code data phiij of YES) and the block concerned are rewritten at the (step S29 to the gradation width-of-face characteristic LD, the average information LA, and code data phiij at the time of encoding the binary image data of a dither pattern PT 4 (step S30). When the values of the average information LA are 143 or more and less than 175, the gradation width-of-face characteristic LD, the average information LA, and code data phiij of YES) and the block concerned are rewritten at the (step S31 to the gradation width-of-face characteristic LD, the average information LA, and code data phiij at the time of encoding the binary image data of a dither pattern PT 5 (step S32). When the values of the average information LA are 175 or more and less than 207, the gradation width-of-face characteristic LD, the average information LA, and code data phiij of YES) and the block concerned are rewritten at the (step S33 to the gradation width-of-face characteristic LD, the average information LA, and code data phiij at the time of encoding the binary image data of a dither pattern PT 6 (step S34). When the values of the average information LA are 207 or more and less than 239, the gradation width-of-face characteristic LD, the average information LA, and code data phiij of YES) and the block concerned are rewritten at the (step S35 to the gradation width-of-face characteristic LD, the average information LA, and code data phiij at the time of encoding the binary image data of a dither pattern PT 7 (step S36). When the value of the average-value information LA is 239 or more (it is NO at step S35), the gradation width-of-face characteristic LD, the average-value information LA, and code data phiij of the block concerned are rewritten to the gradation width-of-face characteristic LD, the average-value information LA, and code data phiij at the time of encoding the binary image data of a dither pattern PT 8.

[0013] In the above-mentioned example, although the concentration level of a solid image is expressed by the dither pattern of 8+1 gradation based on the value of the average-value information LA, the dither pattern of 16+1 gradation may be adopted, and other area gradation methods may be adopted. It is because it is characterized by to rewrite to code data, such as a dither pattern showing the concentration level according to the value of the average-value information specified based on the average value of the image data of a poor image field in the code data of a poor image field which detected and detected the poor image field with coding processing of image data in the image processing system concerning this invention based on the value of the gradation width-of-face characteristic specified based on the difference of each pixel data.

[0014]

[Effect of the Invention] In the image processing system of this invention, binary-ized processing of a solid image field is performed from the data encoded by the compression coding means. Thereby, the mass memory which dedicates all image data becomes unnecessary. Moreover, since binary-ized processing is performed using the data after compression, the number of the data which calculate can decrease and processing can be ended in a short time.

[Translation done.]

* NOTICES *

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damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is drawing showing the flow of coding processing of a GBTC method.
[Drawing 2] It is drawing showing coding processing and decryption processing of a GBTC method.
[Drawing 3] It is the configuration sectional view of the digital color copying machine of the example of an operation gestalt.
[Drawing 4] It is drawing showing each processing block of the reading signal-processing section.
[Drawing 5] It is the flow chart of the image formation processing performed after a power source is switched on.
[Drawing 6] It is the flow chart of dither pattern-ized processing.
[Description of Notations]
100 -- Image read station
105 -- CCD sensor
200 -- Copy section
202 -- Printer exposure section
401 -- Color correction processing section
402 -- Reflection / concentration transform-processing section
403 -- Masking processing section
404 -- Coding/decryption processing section
405 -- gamma amendment processing section
406 -- Compression image memory
407 -- CPU
408 -- ROM
409 -- RAM

[Translation done.]

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CLAIMS

[Claim(s)]
[Claim 1] Image data is divided into the block which consists of predetermined pixel matrices. The gradation width-of-face characteristic specified in the image data of each block based on the difference of each pixel data which constitutes a block, A compression coding means to change into the average-value information specified based on the average value of each above-mentioned pixel data, and the code data specified based on each above-mentioned pixel data, The gradation width-of-face characteristic for every block called for by conversion by the compression coding means, average-value information, and a storage means to memorize code data, A detection means to detect the block belonging to a solid image based on the value of the gradation width-of-face characteristic memorized by the storage means, The gradation width-of-face characteristic memorized by the storage means of the block belonging to the solid image detected by the detection means, The image processing system characterized by having the gradation width-of-face characteristic of the predetermined binary image data showing the concentration level specified in average-value information and code data based on the value of average-value information, average-value information, and the data rewriting means rewritten to code data.

[Translation done.]

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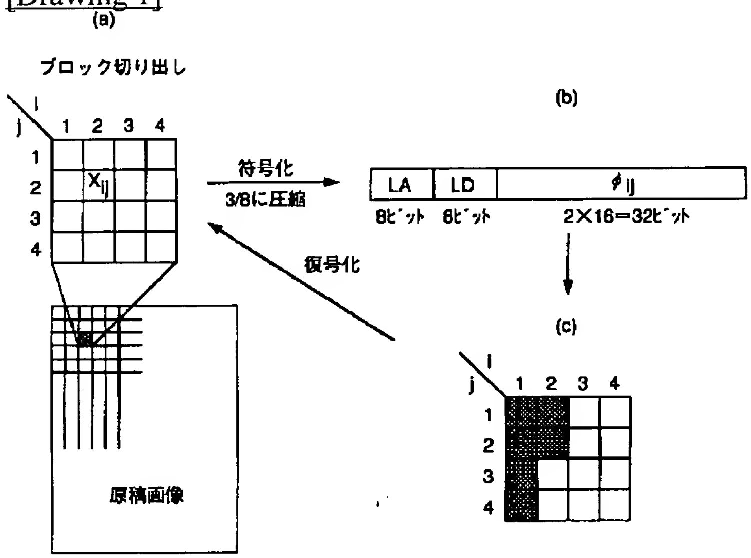
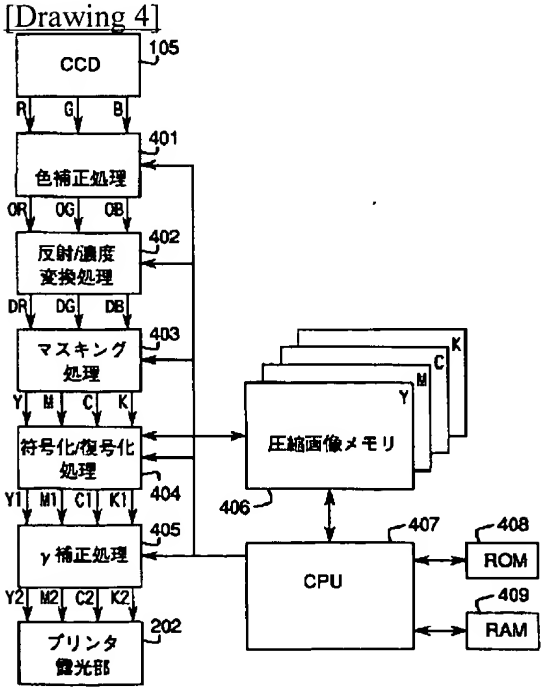
DRAWINGS

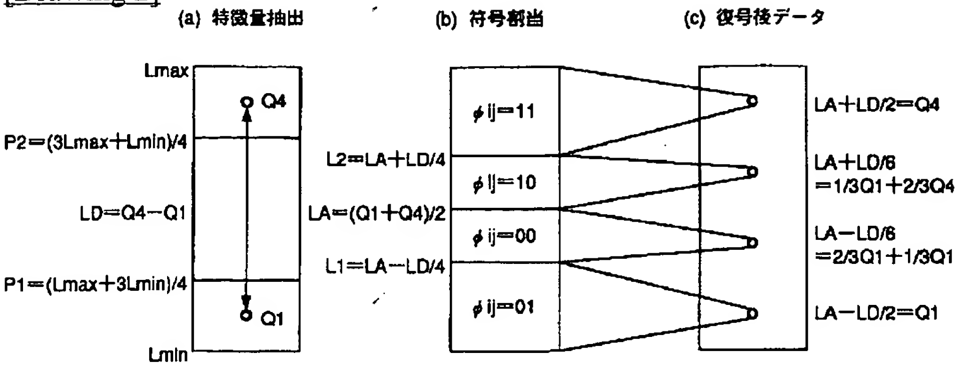
[Drawing 1]



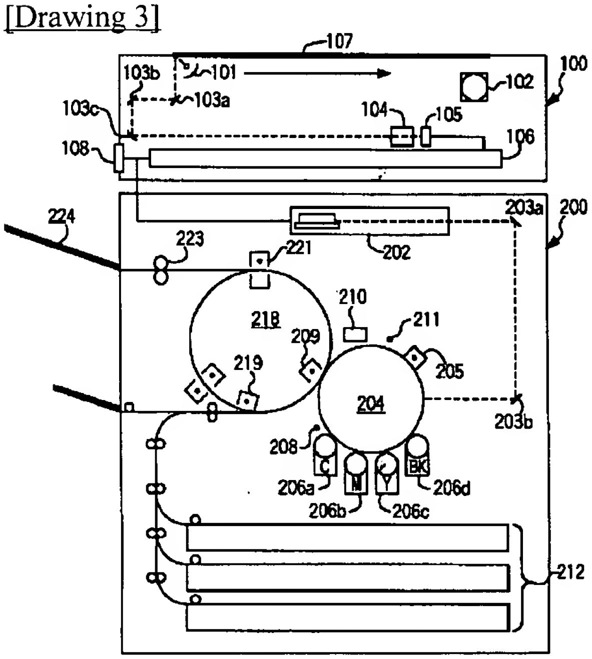
[Drawing 4]



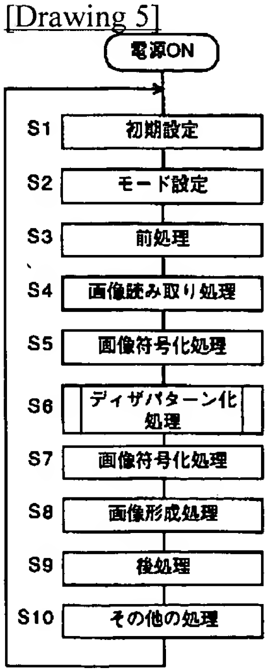
[Drawing 2]



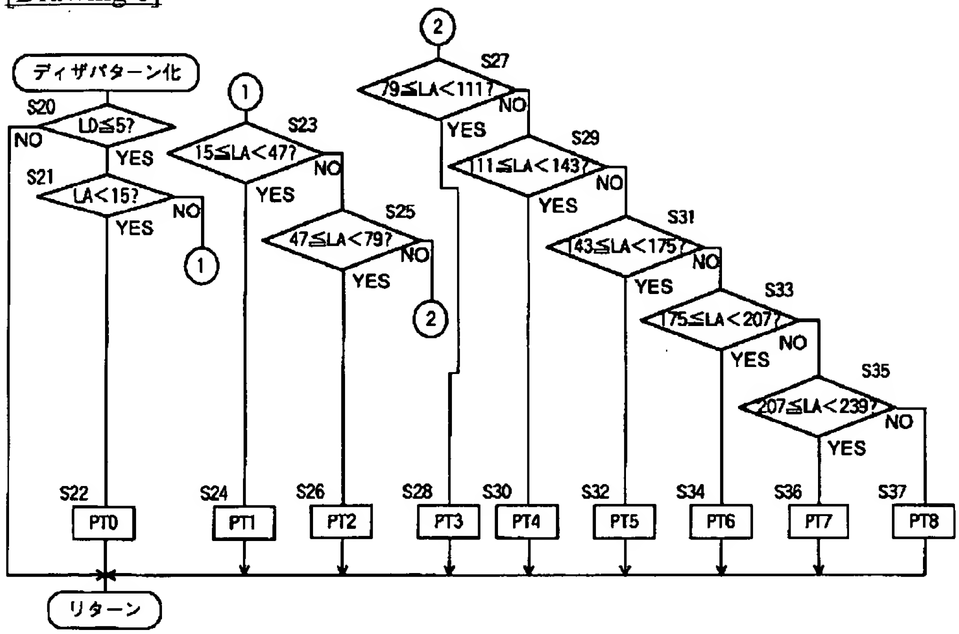
[Drawing 3]



[Drawing 5]



[Drawing 6]



[Translation done.]